

New record for solar cell efficiency signals bright future for solar tech

February 2 2022



Professor Kylie Catchpole. Credit: Australian National University

Researchers at The Australian National University (ANU) have broken their own record to create a more efficient solar cell.

The study, led by Dr. Jun Peng, focused on 1 cm² [solar cells](#) made with perovskites—a family of materials with a specific crystal structure.

Perovskite solar cells have the potential to be made more cheaply and simply than other solar cells, as well as to produce more power in a given area.

The team achieved an efficiency record of 22.6 percent. This means the cells can convert 22.6 percent of sunlight into energy.

They also demonstrated a "fill factor" of more than 86 percent, which is one measure of the quality of the solar cell.

"We're always trying to reach the highest efficiency we can. Commercialisation won't happen without [high efficiency](#)," co-author Professor Kylie Catchpole said.

"But we need a cheap process as well. This is an approach that definitely combines those two elements in a way that's different to how it's been achieved previously."

The researchers say the solar cells they have produced are easier to manufacture.

The [team](#) used standard fabrication techniques but applied them to a [new material](#), titanium oxynitride, to create the perovskite solar cell in a unique way.

"We've also been able to overcome an [energy loss](#) in one of the layers that scientists didn't previous realize was there," Professor Catchpole said.

"The modeling we've done shows this was a limitation in previous types of solar cells."

The results have been published in *Nature*.

More information: Jun Peng et al, Centimetre-scale perovskite solar cells with fill factors of more than 86 per cent, *Nature* (2022). [DOI: 10.1038/s41586-021-04216-5](https://doi.org/10.1038/s41586-021-04216-5)

Provided by Australian National University

Citation: New record for solar cell efficiency signals bright future for solar tech (2022, February 2) retrieved 6 May 2024 from <https://techxplore.com/news/2022-02-solar-cell-efficiency-bright-future.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.